

Name _____ Date _____ Period _____

Calculator Permitted

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**Find all solutions in the interval $[0, 2\pi)$.**

1) $\sin^2 x - \cos^2 x = 0$

A) $x = \frac{\pi}{4}, \frac{\pi}{3}$

C) $x = \frac{\pi}{4}$

B) $x = \frac{\pi}{4}, \frac{\pi}{6}$

D) $x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

1) _____

2) $\sin^2\left(\frac{x}{2}\right) = \sin^2 x$

A) $\frac{2\pi}{3}, \frac{4\pi}{3}$

B) $0, \frac{2\pi}{3}$

C) $0, \frac{2\pi}{3}, \frac{4\pi}{3}$

D) $0, \pi$

2) _____

Find an exact value.

3) $\sin \frac{-11\pi}{12}$

A) $\frac{\sqrt{6} - \sqrt{2}}{4}$

B) $\frac{\sqrt{2} - \sqrt{6}}{4}$

C) $\frac{\sqrt{6} + \sqrt{2}}{4}$

D) $\frac{-\sqrt{6} - \sqrt{2}}{4}$

3) _____

Solve for x in the given interval.

4) $\sec x = -2, \pi \leq x \leq \frac{3\pi}{2}$

A) $\frac{5\pi}{4}$

B) $\frac{2\pi}{3}$

C) $\frac{7\pi}{6}$

D) $\frac{4\pi}{3}$

4) _____

Convert the radian measure to degree measure. Use the value of π found on a calculator and round answers to two decimal places.

5) 0.668

A) 37.57°

B) 38.27°

C) 38.77°

D) 39.27°

5) _____

Use basic identities to simplify the expression.

6) $\sin^2 \theta + \tan^2 \theta + \cos^2 \theta$

A) $\cos^3 \theta$

B) $\sin \theta$

C) $\tan^2 \theta$

D) $\sec^2 \theta$

6) _____

7) $\frac{\cos^2 \theta}{\sin^2 \theta} + \csc \theta \sin \theta$

A) 1

B) $\tan^2 \theta$

C) $\csc^2 \theta$

D) $\sec^2 \theta$

7) _____

Write the expression using only the indicated logarithms.

8) $\log_3(x + y)$ using natural logarithms

8) _____

A) $\ln(x + y) + \ln 3$

B) $\frac{\ln(x + y)}{\ln 3}$

C) $\frac{\ln 3}{\ln(x + y)}$

D) $\ln(x + y) \ln 3$

Simplify the expression.

9) $\csc\left(\frac{\pi}{2} - x\right) \cos(-x)$

9) _____

A) $-\csc^2 x$

B) -1

C) $\cos^2 x$

D) 1

10) $\frac{1 - \sin^2 x}{\sin x - \csc x}$

10) _____

A) $-\sin x$

B) $\cos^2 x$

C) $-\cos x$

D) $\sin^2 x$

11) $\frac{1}{1 - \cos x} + \frac{1}{1 + \cos x}$

11) _____

A) $\csc^2 x$

B) $2 \csc^2 x$

C) $2 \sec^2 x$

D) $2 \csc x$

Determine whether the given function is positive or negative for values of t in the specified quadrant.

12) Quadrant II, $\cot t$

12) _____

A) Positive

B) Negative

Find dy/dx .

13) $y = (x^2 - 4x + 2)(4x^3 - x^2 + 4)$

13) _____

A) $20x^4 - 68x^3 + 36x^2 + 4x - 16$

B) $4x^4 - 68x^3 + 36x^2 + 4x - 16$

C) $4x^4 - 64x^3 + 36x^2 + 4x - 16$

D) $20x^4 - 64x^3 + 36x^2 + 4x - 16$

14) $y = \frac{7x - 8}{8x^2 + 3}$

14) _____

A) $\frac{56x^3 - 112x^2 + 149x}{(8x^2 + 3)^2}$

B) $\frac{-56x^2 + 107x + 45}{(8x^2 + 3)^2}$

C) $\frac{168x^2 - 128x + 21}{(8x^2 + 3)^2}$

D) $\frac{-56x^2 + 128x + 21}{(8x^2 + 3)^2}$

15) $y = \frac{1}{2}x^8 - \frac{1}{4}x^4$

15) _____

A) $\frac{1}{2}x^7 - \frac{1}{4}x^3$

B) $4x^9 - x^5$

C) $4x^8 - x^4$

D) $4x^7 - x^3$

Solve the problem.

16) The radius of a car wheel is 12 inches. How many revolutions per minute is the wheel making when the car is travelling at 25 mph. Round your answer to the nearest revolution.

16) _____

A) 14 rpm

B) 2017 rpm

C) 3456 rpm

D) 350 rpm

- 17) A car wheel has a 15-inch radius. Through what angle (to the nearest tenth of a degree) does the wheel turn when the car rolls forward 1 ft? 17) _____
- A) 45.8° B) 55.8° C) 50.8° D) 60.8°

Write each expression in factored form as an algebraic expression of a single trigonometric function.

- 18) $\sec^4 x + \sec^2 x \tan^2 x - 2 \tan^4 x$ 18) _____
- A) $\tan^2 x - 1$ B) $4 \sec^2 x$ C) $3 \sec^2 x - 2$ D) $\sec^2 x + 2$

Use the fundamental identities to find the value of the trigonometric function.

- 19) Find $\csc \theta$ if $\cot \theta = -\sqrt{15}$ and $\cos \theta < 0$. 19) _____
- A) -4 B) $\frac{1}{4}$ C) $-\frac{1}{4}$ D) 4

Suppose that θ is in standard position and the given point is on the terminal side of θ . Give the exact value of the indicated trig function for θ .

- 20) $(-5, 12)$; find $\sin \theta$. 20) _____
- A) $-\frac{12}{13}$ B) $\frac{5}{13}$ C) $\frac{12}{13}$ D) $-\frac{5}{13}$

Find the measures of two angles, one positive and one negative, that are coterminal with the given angle.

- 21) $\frac{9\pi}{5}$ 21) _____
- A) $\frac{14\pi}{5}; -\frac{\pi}{5}$ B) $\frac{14\pi}{5}; -\frac{14\pi}{5}$ C) $\frac{\pi}{5}; -\frac{19\pi}{5}$ D) $\frac{19\pi}{5}; -\frac{\pi}{5}$

Rewrite with only $\sin x$ and $\cos x$.

- 22) $\cos 2x + \sin x$ 22) _____
- A) $1 - 2 \sin^2 x + \sin x$ B) $1 + 3 \sin x$
 C) $1 + 3 \sin^2 x$ D) $1 + 2 \sin^2 x + \sin x$

- 23) Find $\sec \beta$, if $\sin \beta = -\frac{5}{10}$ and $\tan \theta > 0$ 23) _____
- A) $\frac{\sqrt{10}}{5}$ B) $-\frac{5\sqrt{75}}{75}$ C) $-\frac{\sqrt{75}}{10}$ D) $-\frac{10\sqrt{75}}{75}$

- 24) $\csc 0.2101 =$ 24) _____
- A) 0.2086 B) 0.9780 C) 1.0225 D) 4.7948

Convert from degrees to radians. Use the value of π found on a calculator and round answers to four decimal places, as needed.

- 25) 216° 25) _____
- A) $\frac{3\pi}{5}$ B) $\frac{12\pi}{5}$ C) $\frac{7\pi}{10}$ D) $\frac{6\pi}{5}$

Assume that θ is an acute angle in a right triangle satisfying the given conditions. Evaluate the indicated trigonometric function.

26) $\sin \theta = \frac{8}{9}$; $\cot \theta$

26) _____

A) $\frac{9}{\sqrt{17}}$

B) $\frac{\sqrt{17}}{8}$

C) $\frac{\sqrt{17}}{9}$

D) $\frac{8}{\sqrt{17}}$

Find an algebraic expression equivalent to the given expression.

27) $\sin(\operatorname{arcsec} u)$

27) _____

A) $\sqrt{u^2 - 1}$

B) $\frac{\sqrt{u^2 - 1}}{u}$

C) $\frac{u\sqrt{u^2 + 1}}{u^2 + 1}$

D) $\sqrt{u^2 + 1}$

Use the product, quotient, and power rules of logarithms to rewrite the expression as a single logarithm. Assume that all variables represent positive real numbers.

28) $6 \log_m p - 5 \log_m y^2$

28) _____

A) $\log_m \frac{p^6}{y^{10}}$

B) $\log_m \frac{6p}{5y^2}$

C) $\log_m \frac{p^6}{y^7}$

D) $\log_m \frac{p^6}{2y^5}$

Write the expression as the sine, cosine, or tangent of an angle.

29) $\cos \frac{\pi}{2} \cos \frac{\pi}{7} + \sin \frac{\pi}{2} \sin \frac{\pi}{7}$

29) _____

A) $\sin \frac{9\pi}{14}$

B) $\cos \frac{5\pi}{14}$

C) $\cos \frac{9\pi}{14}$

D) $\sin \frac{5\pi}{14}$

Find all solutions to the equation in the interval $[0, 2\pi)$.

30) $\sin 2x = -\sin x$

30) _____

A) $0, \frac{2\pi}{3}, \pi, \frac{4\pi}{3}$

B) $\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

C) No solution

D) $\frac{\pi}{8}, \frac{9\pi}{8}$

Find the exact value by using a half-angle identity.

31) $\cos \left[-\frac{\pi}{8} \right]$

31) _____

A) $\frac{1}{2} \sqrt{1 - \sqrt{2}}$

B) $\frac{1}{2} \sqrt{1 + \sqrt{2}}$

C) $\frac{1}{2} \sqrt{2 + \sqrt{2}}$

D) $\frac{1}{2} \sqrt{2 - \sqrt{2}}$

Write an equation for a sine curve that has the given amplitude and period, and which passes through the given point.

32) Amplitude 4, period $\pi/4$, point $(1/3, 0)$

32) _____

A) $y = 4 \sin \left[4x - \frac{4}{3} \right]$

B) $y = 4 \sin \left[8x - \frac{\pi}{3} \right]$

C) $y = 4 \sin \left[\frac{\pi}{4}x - \frac{\pi}{3} \right]$

D) $y = 4 \sin \left[8x - \frac{8}{3} \right]$

Solve the equation.

33) Solve $\cot \theta = \sqrt{3}$ for θ , where $0^\circ \leq \theta \leq 90^\circ$

33) _____

A) 60°

B) 75°

C) 45°

D) 30°

Answer Key

Testname: PRECAL SPRING FINAL REVIEW AND TEST 2016 UNDERCLASSMEN

- 1) D
- 2) C
- 3) B
- 4) D
- 5) B
- 6) D
- 7) C
- 8) B
- 9) D
- 10) A
- 11) B
- 12) B
- 13) A
- 14) D
- 15) D
- 16) D
- 17) A
- 18) C
- 19) D
- 20) C
- 21) D
- 22) A
- 23) D
- 24) D
- 25) D
- 26) B
- 27) B
- 28) A
- 29) B
- 30) A
- 31) C
- 32) D
- 33) D